

It Works?

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Panel Discussion:

What Decision Makers Want to Know and What They Should Know

Second Annual Climate Change Research Conference

California Energy Commission

&

First Scientific Conference of West Coast Governors' Global Warming Initiative

Sacramento, California

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[for more details, see: <http://stephenschneider.stanford.edu/>]

Take Home Messages:

- *Climate Trends are Real and Likely To Accelerate

- (But learn to love probabilistic, risk-management framework)

- *Longer Summer “Dry Season”/Higher Late Summer Water Demand

- *Variability Rides On Top Of Trends (Possible Feedbacks)

- storm intensity

- evaporative demand

- snow melt

- fire impacts (most damages from top few major events)

- *Build In Safety Factors And Performance Standards

- levee height above traditional rules of thumb

- fuel efficiency

- window performance

- lighting efficiency

- HVAC efficiency and health standards(“my home is my castle” obstacle)

- *Plea: Non-polemical Debate

- ”Kyoto Protocol would bankrupt America” (note price of gasoline up \$1.50 in past year equivalent to >\$250 ton C—economy still here!—empirical demonstration of the exaggerated claims and scare tactics of some anti-climate policy ideologists)

- *Inequitable Distribution OF Impacts and Capacity To Mitigate/Adapt

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Keetch-Byram Drought Index as a measure of forest fire

- The drought index is defined as, “a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff or upper soil layers” (Keetch and Byram, 1968)
- The values of KBDI range from 0-800, with 800 indicating extreme drought and 0 indicating saturated soil.
- High values of the KBDI are an indication that conditions are favorable for the occurrence and spread of wildfires because more fuel is available for combustion (i.e. fuels have a lower moisture content)

Relation of KBDI to fire behavior

- **0 - 200** : Soil and fuel moisture are high and do not contribute significantly to fire intensity
- **200-400**: Lower litter and duff layers start drying and beginning to contribute to fire intensity. Fires burn more readily
- **400 - 600** : Very intense fires. The intensity can be expected to increase at an almost exponential rate from the lower to the upper end of this range.
- **600 - 800** : This represents most severe drought conditions resulting from an extended period of little or no precipitation and high day time temperatures. The index is associated with severe drought, increased wildfire occurrence, intense and deep burning fires.

Ref:- Keetch and Byram, 1968; Melton, M., 1996.

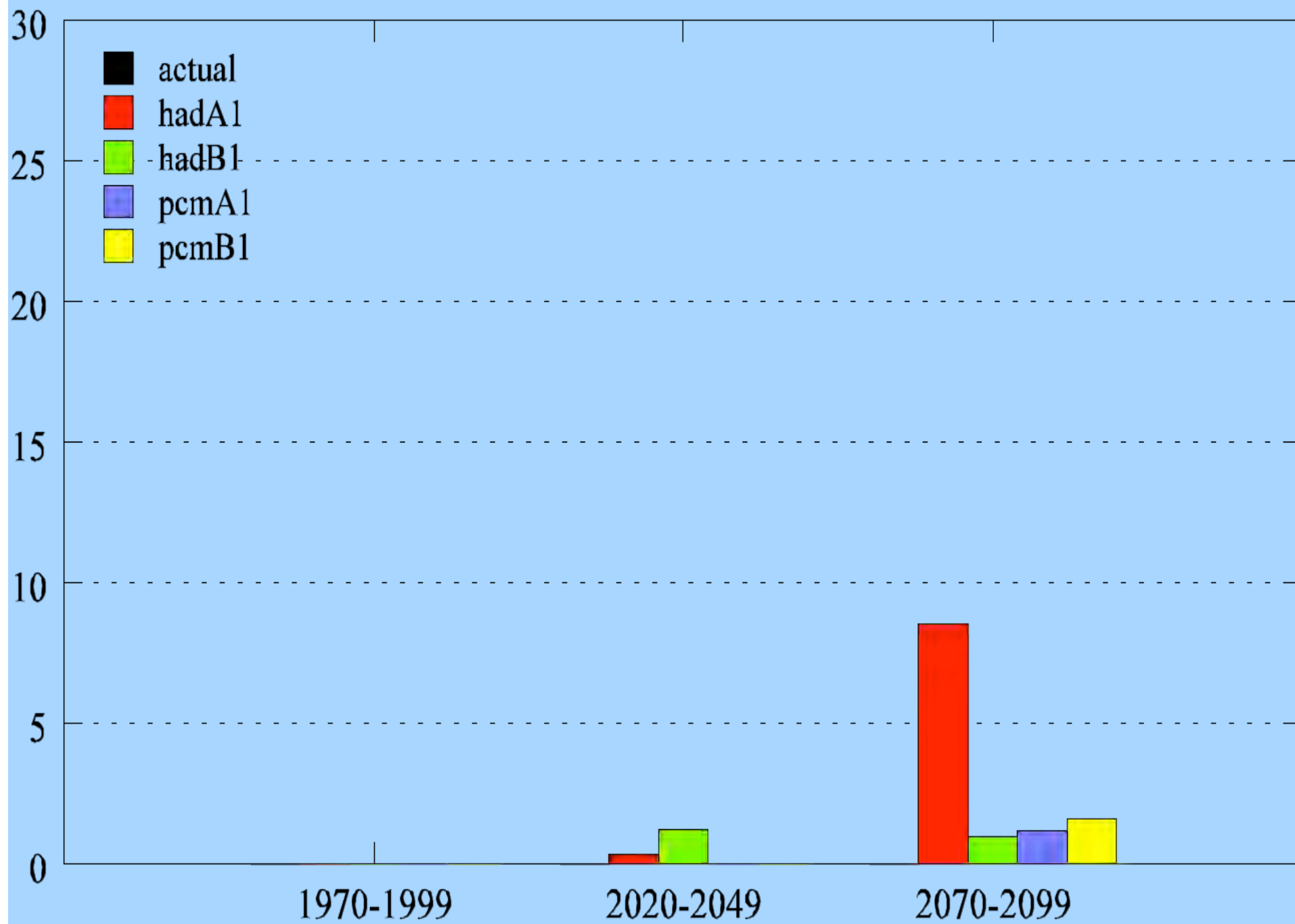
HADCM3 and PCM projections

- The analysis is based on climate projections for the lowest (B1 \approx 550 ppm of CO₂) and highest (A1fi \approx 970 ppm of CO₂) Intergovernmental Panel on Climate Change (IPCC) emission pathways
- Two global climate models, PCM and HadCM3 were used to project monthly temperature and precipitation data after bias correction and statistical downscaling to a 1/8 degree grid (Hayhoe et al, 2004).
- The bias corrected and downscaled monthly data was further downscaled to daily data by randomly re-sampling from the historical record.

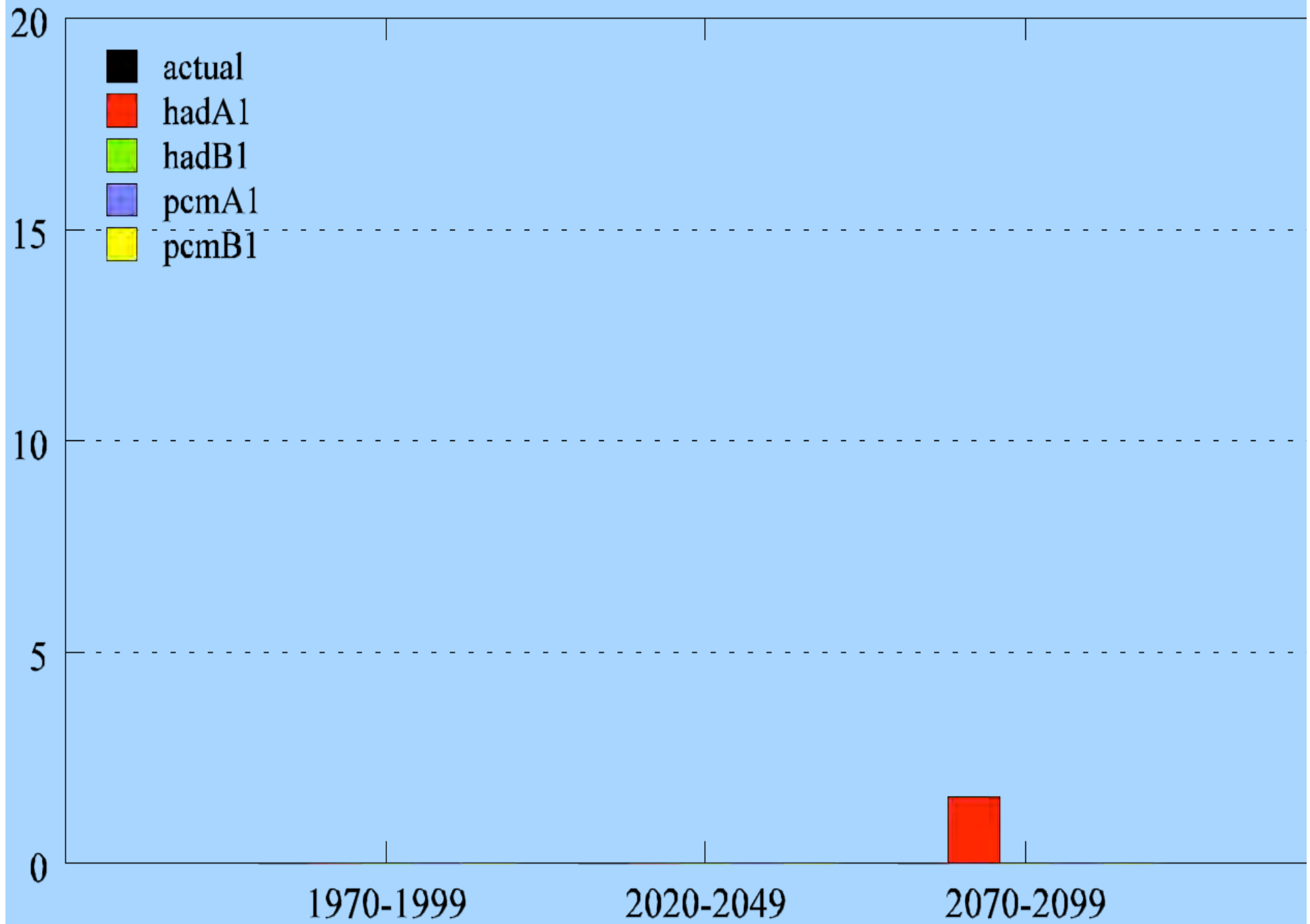
(Source: Edwin Maurer, Santa Clara University

<http://www.engr.scu.edu/~emaurer/data.shtml>

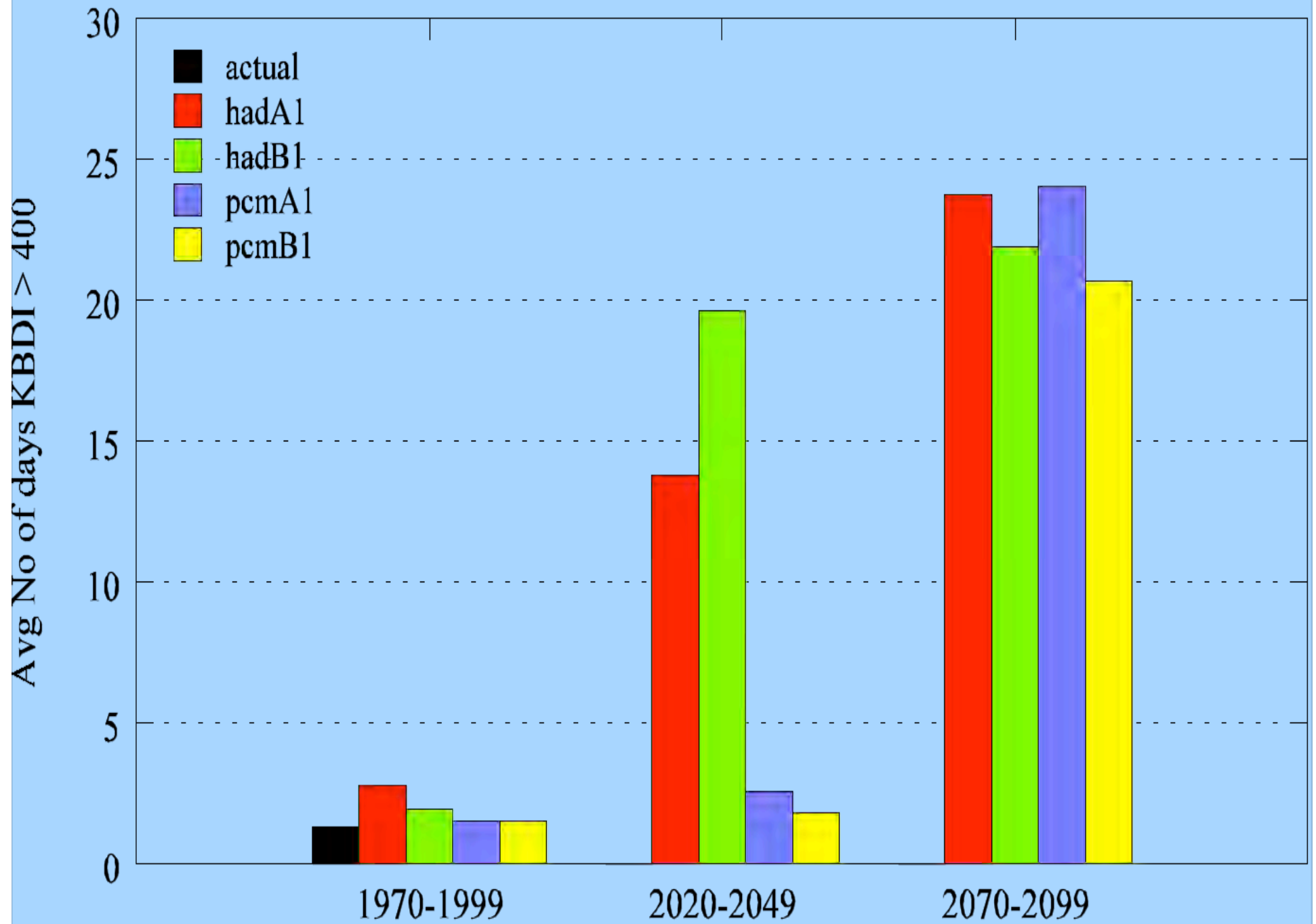
Avg No of days in Jul with KBDI > 400 for all climate models



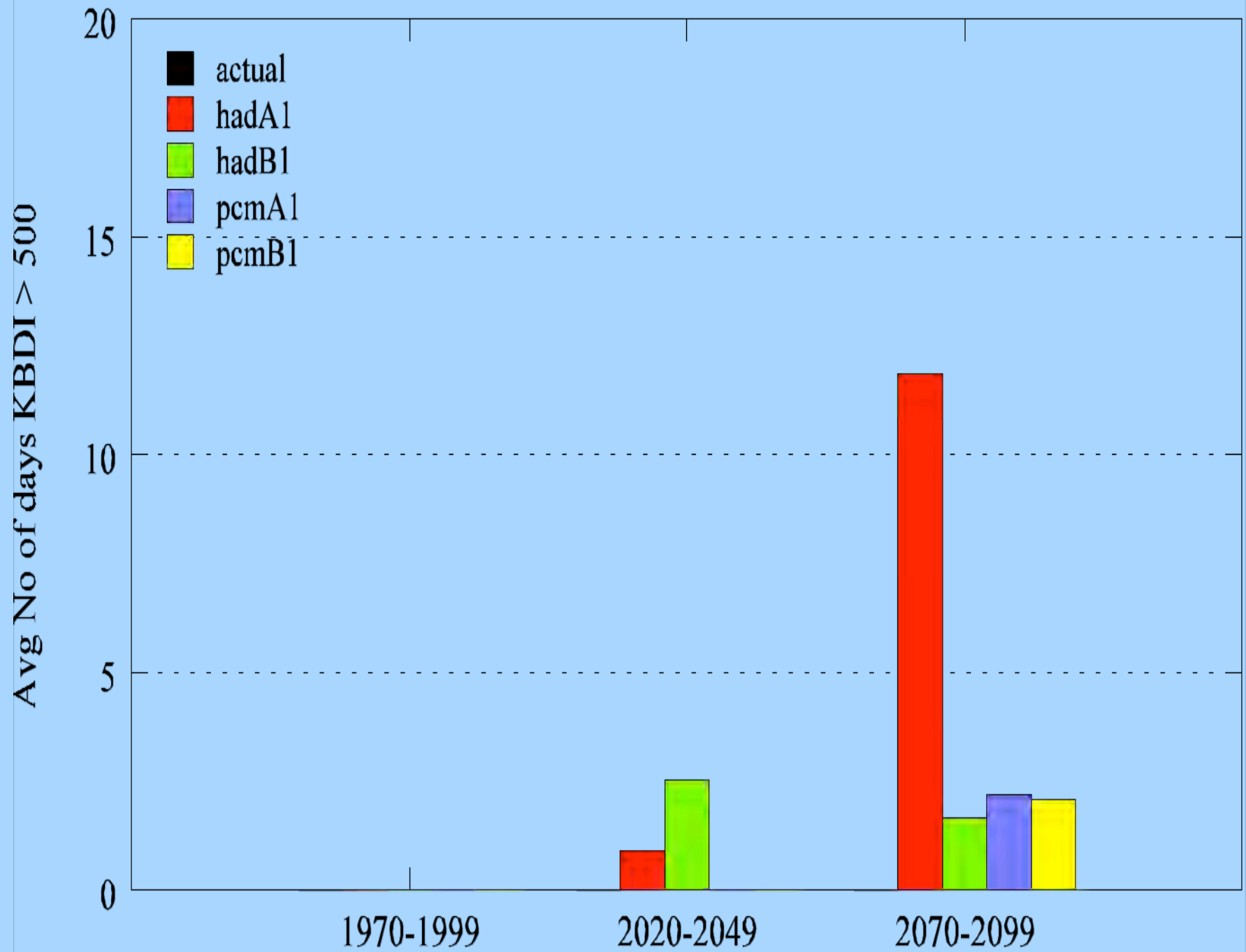
Avg No of days in Jul with KBDI > 500 for all climate models



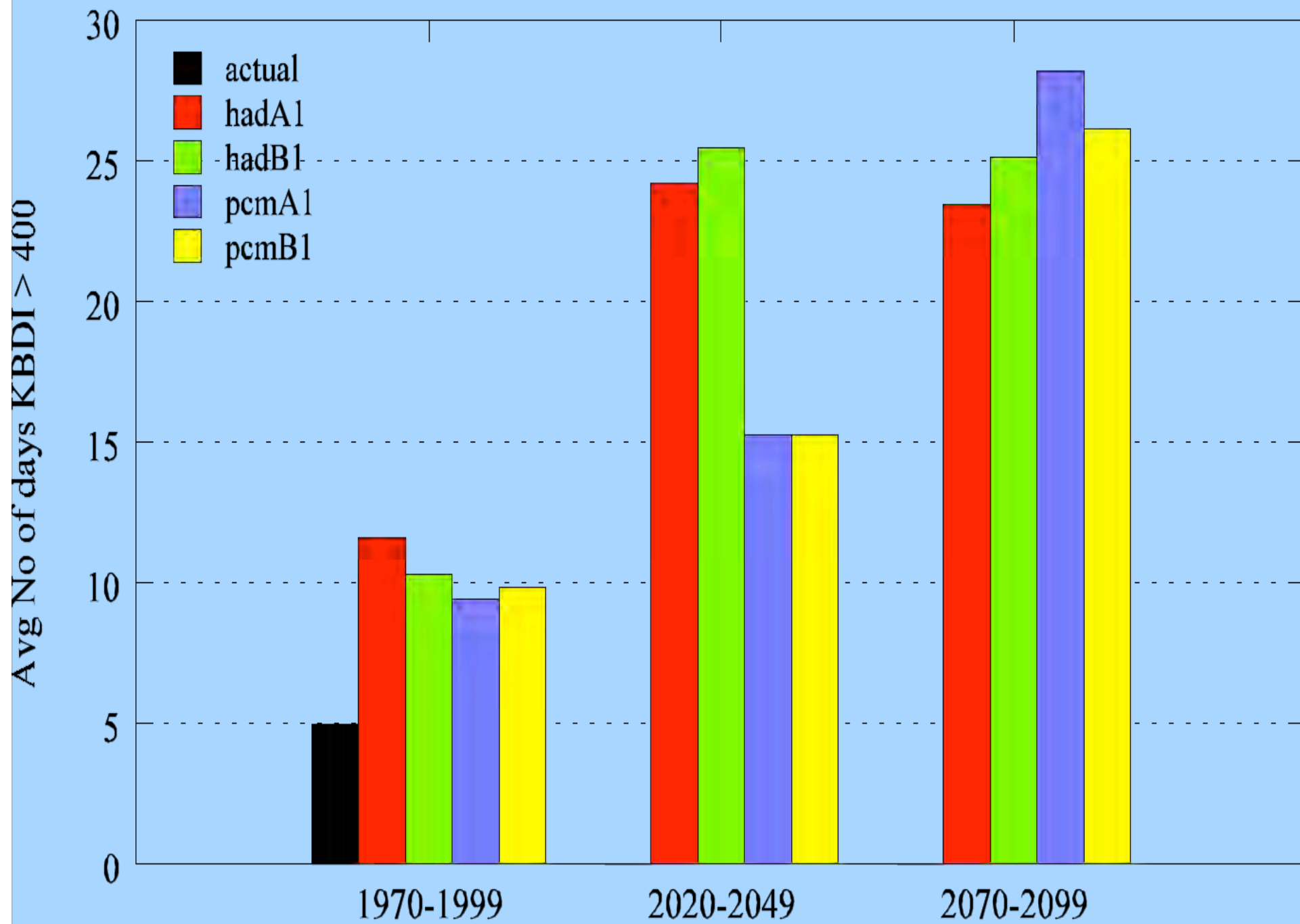
Avg No of days in Aug with KBDI > 400 for all climate models



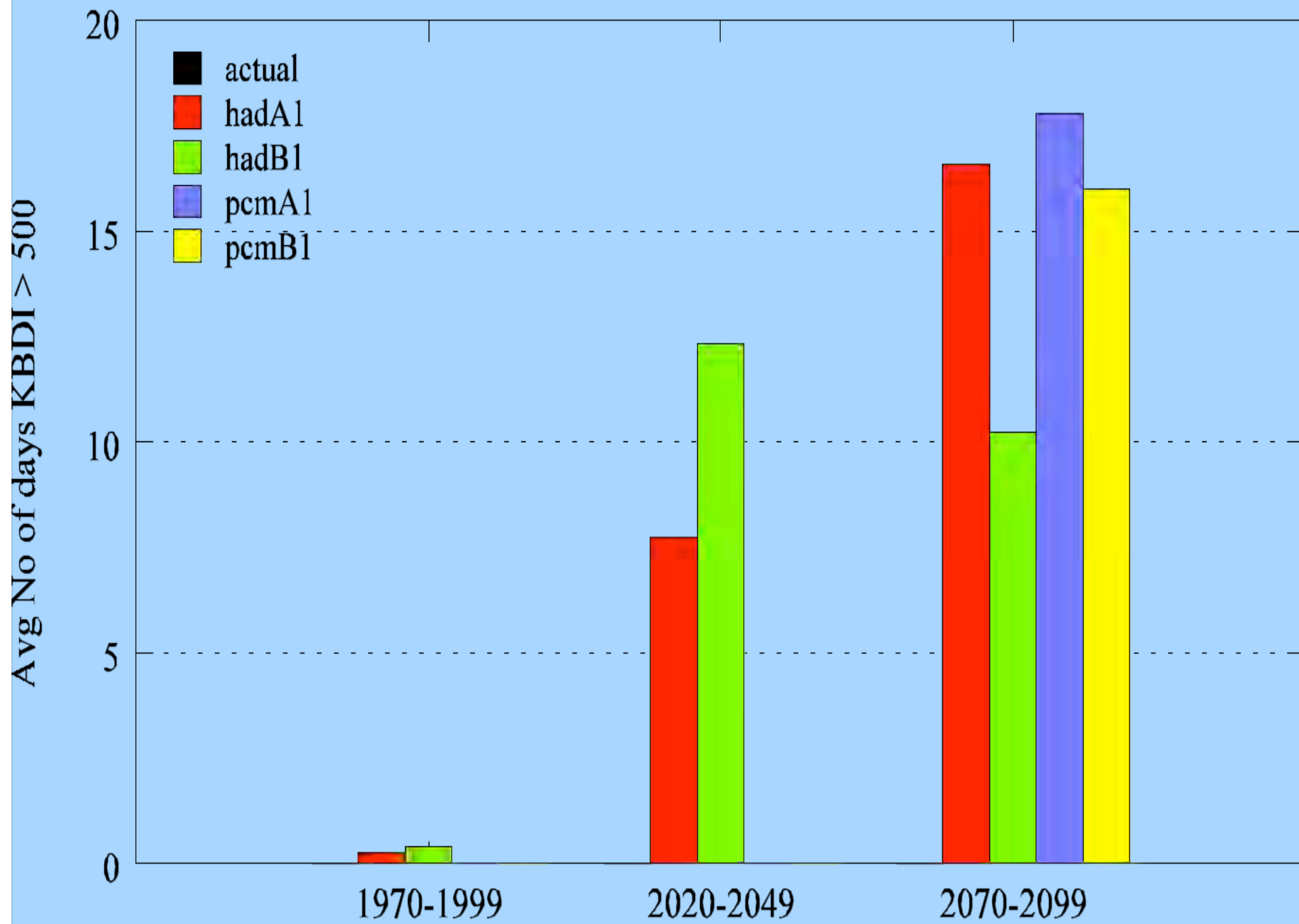
Avg No of days in Aug with KBDI > 500 for all climate models



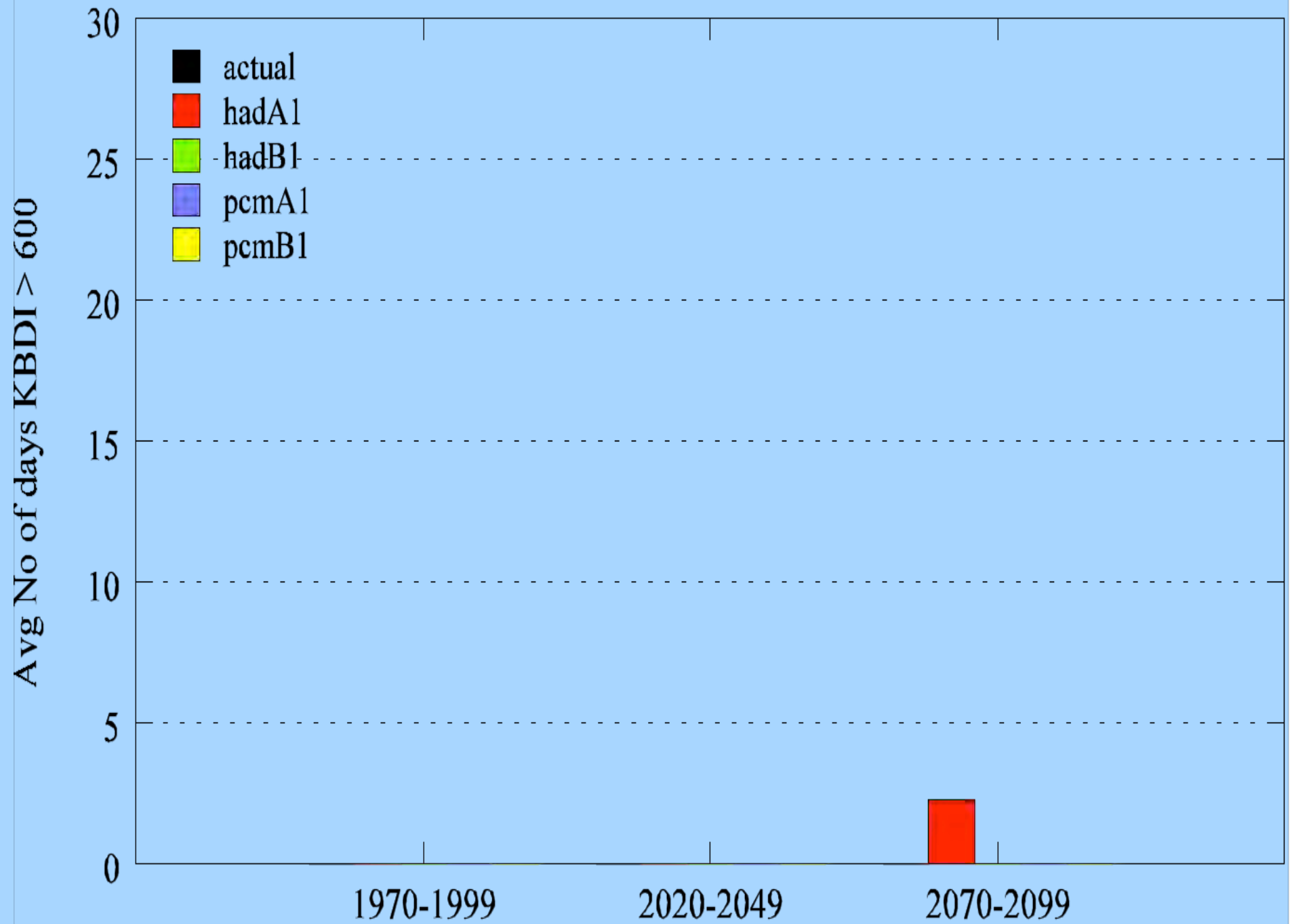
Avg No of days in Sep with KBDI > 400 for all climate models



Avg No of days in Sep with KBDI > 500 for all climate models



Avg No of days in Sep with KBDI > 600 for all climate models



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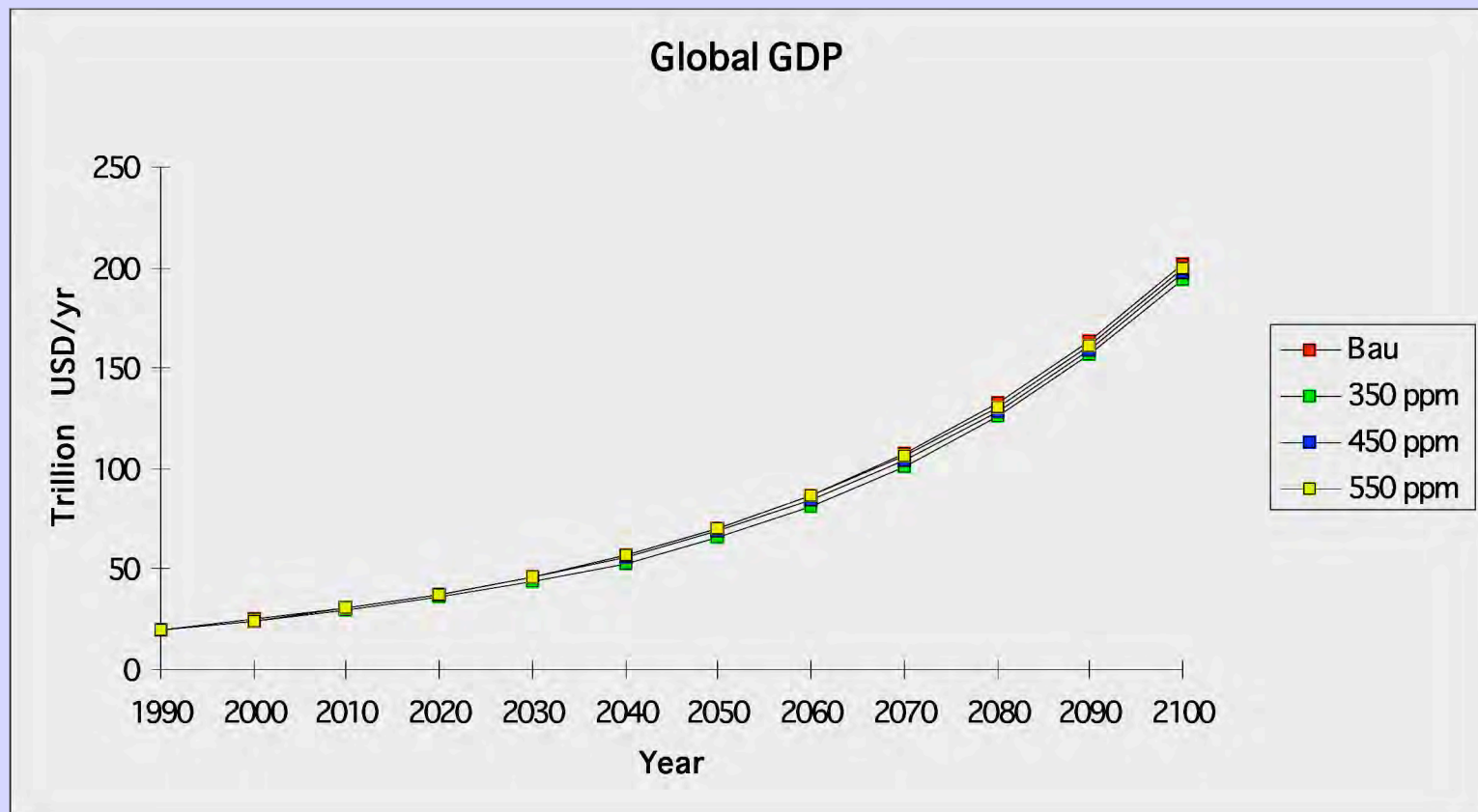
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The cost to stabilise the atmosphere



Source Azar & Schneider, 2002. Ecological Economics

[Schneider's personal views: Global Scale]

Recommendations For Action

1-Good Debate on Issues/Actions

2-Do What Already Makes Sense: Co-Benefits

- energy efficiency
- reducing oil imports
- reducing local air pollution
- reducing congestion..

3-Address Health Issues

- ozone
- particulates
- asthma
- wildfire
- heat waves

4-Fairness and Equity

- mitigate impacts on most vulnerable
- reduce burden on lowest income groups

5-Adopt Long-term Perspective

- children and grandchildren...
- plants and animals: sustainability over centuries

QUESTIONS AND
COMMENTS PLEASE

